

REMARKS

Claims 1, 3, 4, 6 through 10, 12 through 19, 21 through 23 and new Claims 24 and 25 are pending in the application.

Claim 1 has been amended to reflect advantageous food casings formed from (i) aliphatic polyamide and/or copolyamide and (ii) at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer. Support for this amendment can be found in the Application-as-filed, for example on Page 5, line 30 through Page 6, line 12.

Claim 1 has been amended to emphasize advantageous inventive food casings in which the food casing water vapor permeability is essentially imparted by the synthetic polymers. Support for this amendment can be found in the Application-as-filed, for example on Page 7, lines 4 through 5.

Claim 3 has been amended to reflect advantageous embodiments in which the shirred food casing has a sigma-5 value (longitudinal/transverse, measured wet) of less than 10/10 N/mm². Support for this amendment can be found in the Application-as-filed, for example on Page 5, lines 1 through 2.

Claim 23 has been amended to reflect advantageous embodiments in which the inventive food casings are formed from synthetic polymers consisting of a mixture of a single copolyamide; polyether block amide; and partially or completely saponified polyvinylacetate. Support for this amendment can be found in the Application-as-filed, for example on Page 8, lines 5 through 10.

Claims 24 and 25 have been added to complete the record for examination and highlight advantageous embodiments of the invention.

Claim 24 is directed to advantageous embodiments in which the water-soluble polymer is other than polyvinylpyrrolidone. Support for Claim 24 can be found in the Application-as-filed, for example on Page 6, lines 4 through 6.

Claim 25 is directed to advantageous food casings formed from polymer selected from (i) aliphatic polyamide and/or copolyamide and (ii) at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer, in which the shirred food casing has a sigma-5 value (longitudinal/transverse, measured wet) of less than 20/20 N/mm². Support for Claim 25 can be found in the Application-as-filed, for example on Page 5, line 30 through Page 6, line 12 and Page 4, line 32 through Page 5, line 2.

Applicants respectfully submit that this response does not raise new issues, but merely places the above-referenced application either in condition for allowance, or alternatively, in better form for appeal. Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Section 112 Rejection

Claims 1, 4, 6 through 10, 15 through 19 and 23 stand rejected over the recitation “water vapor permeability is essentially determined by the synthetic polymers.” Without addressing the merits of the rejection and solely to advance prosecution of the above-referenced case, Claim 1 has been amended to recite that water vapor permeability is “imparted” by the synthetic polymers. As noted above, support for this non-narrowing amendment can be found in the Application-as-filed. Applicants further respectfully submit that there is no requirement under United States practice of “in ipso verbis.” Accordingly, Applicants respectfully request withdrawal of the foregoing rejection.

*The Claimed Invention is Patentable
in Light of the Art of Record*

Claims 1, 3, 4, 6 through 10, 12 through 19 and 21 through 23 stand rejected in light of United States Patent No. 7,001,635 ("US 635") to Merritt et al. in view of JP 2002-306059 ("JP 059") to Nobuyuki; United States Patent No. 6,203,750 ("US 750") to Ahlgren et al. and United States Published Patent Application No. 2004/0062834 ("US 834") to Cruz.

Applicants respectfully note with gratitude the Examiner's indication within the outstanding Office Action on Page 2, Ref. No. 1 that the claims as-amended are considered patentable in light of the combination of US 635, US 750 and US 834. Accordingly, the remarks which follow will emphasize the distinguishing features of newly cited JP 059.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

Applicants respectfully reiterate that food casings, especially sausage casings, are predominantly offered in shirred form. Cellulose-based shirred casings, such as those disclosed in US 635, are known. Shirred sticks formed from synthetic polymers are also known; however, such shirred sticks are generally not very stable without net-type or reinforcing packaging, and are thus not in widespread use. Heretofore known synthetic polymer-based casings exhibit a relatively high resilience, resulting in the re-expansion of the shirred stick and associated pleat loss. (In that regard, the Examiner's attention is kindly directed to the Application-as-filed on Page 2, lines 1 through 14, as well as US 834, Para. 0016, fifth sentence). Coatings incorporating a binder, such as a cellulosic binder, may be used to impart shirred stick stability. The coating binder must not overly adhere the pleats together; however, as the shirred stick must readily expand during subsequent stuffing.

In addition to shirred pleat stability, polymer-based food casings should advantageously provide a balance of additional properties, including only modest bending of the shirred tube (thereby avoiding the conventional external reinforcement) and acceptable water vapor permeability.

Unexpectedly, Applicants have found synthetic polymer blends that may be used to form food casings exhibiting a heretofore unknown balance of beneficial properties, including shirred stick stability, advantageous tensile properties and water vapor permeability.

Applicants have more particularly found that food casing consisting essentially of a particular blend of polymers that includes polyamide or copolyamide and at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer provides a highly advantageous balance of adequate stiffness, shirr stability and water vapor permeability, as recited in the claims as-amended.

Specifically, Applicants have found that polymer blends including (i) aliphatic polyamides or copolyamides and (ii) at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer bends under the effect of its own weight by no more than 20 % and exhibits a water vapor permeability of 20 to 1000 g/m² d, as recited in the claimed invention.

Applicants respectfully reiterate that the inventive food casings may further advantageously be compressed to a ratio of 100:1 or more, as additionally recited in the claimed invention. In contrast, conventional casings, such as cellulose-based casings, are typically shirred at much lower compression ratios, such as a 70:1 ratio. In that regard, the Examiner's attention is kindly directed to the Application-as-filed on Page 8, lines 28 through 31. The elevated inventive compression ratios result in a higher number of casings per shirred stick, reducing operating costs for both the casing manufacturer and the downstream sausage producer.

In especially advantageous embodiment, the inventive shirred casing further comprises at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment and said shirred casing extends in the longitudinal direction by no more than 10% when it is stored on a smooth, planar support, without packaging, at room temperature and 60 % relative humidity, as recited in Claim 22.

The cited references do not teach or suggest the claimed invention. Applicants specifically respectfully submit that newly cited secondary reference, JP 059, does not cure the deficiencies within the earlier cited references.

JP 059 is merely directed to smokeable films. [0001]. JP 059 particularly discloses a polymer mixture formed from polyamide and cross-linked polyvinyl pyrrolidone that provides “good smoke-dried scents, smoke-dried colors, and smoking flavor.” [0008; 0017 and 0020]. JP 059 specifically notes that its casing is “flexible.” [0020]. JP 059 merely generically indicates that its casings are “filled up with foodstuffs.” [0022 and 0032]. In contrast to the recited water-soluble polymer, JP 059 indicates that its cross-linked polyvinyl pyrrolidone “absorb[s]” up to 30 times moisture. [0017]. Applicants thus respectfully submit that the polyvinyl pyrrolidone has been treated, i.e. crosslinked, to diminish or eliminate its water solubility, in contrast to the urgings of the outstanding Office Action on Page 5, first full paragraph.

JP 059 does not teach or suggest polymer blends containing aliphatic polyamides or copolyamides and at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer, much less that food casings formed from such blends would have intrinsic shirr stability, as recited in Claim 1 as-amended. JP 059 instead expressly requires the incorporation of crosslinked polyvinyl pyrrolidone into its resin compositions. Applicants respectfully submit that there would have been no expectation of success in forming the inventive casings in light of the express teachings of JP 059, requiring a crosslinked polymer. Applicants further respectfully submit that to modify JP 059 so as to avoid its required crosslinked polyvinyl pyrrolidone would altogether change its principle of operation.

Nor does JP 059, teaching that its casings are “flexible,” teach or suggest that the inventive polymer blends would translate into shirred food casings bending under the effect of their own weight by no more than 20 %. In fact, JP 059 teaches away from such casings.

And JP 059, altogether silent as to shirring, most certainly does not teach or suggest that the inventive polymer blends could be used to form food casings compressed in a ratio of 100:1 or more.

JP 059 thus can not teach or suggest advantageous embodiments in which the shirred food casing has a sigma-5 value (longitudinal/transverse, measured wet) of less than 10/10 N/mm², as recited in Claim 3 as-amended, or of less than 20/20 N/mm², as recited in newly added Claim 25.

JP 059 similarly fails to teach or suggest such food casings in which, after shirring, the casing extends in the longitudinal direction by no more than 15 % when stored on a smooth planar support at room temperature and 60 % rh, as recited in Claim 4.

JP 059 likewise fails to teach or suggest inventive shirred food casings in which the shirred food casing achieves the required intrinsic stability by an adhesion-promoting treatment or impregnation consisting of one or more of oil or water, and optional corona-treatment, as recited in Claim 15.

JP 059 further fails to teach or suggest that advantageous inventive food casings having sufficient intrinsic stability to be processed on fully automatic stuffing machines in which the shirred casing further includes at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment would result in shirred casings extending in the longitudinal direction by no more than 10% when stored on a smooth, planar support, as recited in Claim 22. Applicants respectfully reiterate that JP 059 is instead altogether silent as to shirring.

And JP 059, requiring crosslinked polyvinyl pyrrolidone, most certainly does not teach or suggest advantageous food casings in which the water-soluble polymer is other than polyvinylpyrrolidone, as recited in newly added Claim 24.

Accordingly, Applicants respectfully submit that JP 059 does not teach or suggest the claimed invention, considered either alone or in combination with the remaining art of record.

Applicants respectfully concur with the Examiner's indication within the outstanding Office Action on Page 2, Ref. No. 1 that the claimed invention is patentable in light of US 635, US 750 and US 834.

Applicants respectfully reiterate that US 635 is generally directed to cellulosic casings containing liquid smoke that provide an enhanced smoky color and flavor to foods via an alkaline treatment. (Col. 1, lines 6 through 10 and Col. 6, lines 9 through 24). US 635 merely generically notes that casings formed from polymeric materials may be used within its invention. (Col. 6, lines 55 – 57). US 635 applies the liquid smoke prior to or during shirring. (Col. 8, lines 27 – 34).

In contrast to the inventive intrinsically stable shirred casings, US 635 further expressly teaches that its casings are treated on the inside with a shirring solution to form self-sustaining sticks that “have sufficient coherency to hold together immediately after shirring through shipping and ultimate use.” (Col. 7, lines 10 – 12 and Col. 8, line 67 – Col. 9, line 5). The shirring solution used to form the working examples of US 635 incorporates carboxymethyl cellulose. (Col. 11, lines 24 – 43).

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 635, considered either alone or in combination with the remaining art of record.

Applicants respectfully reiterate that US 750 is directed to multilayered heat shrinkable casings suitable for cook-in use. (Col. 2, lines 5 – 7). The films of US 750 include a layer having a mixture of at least two polyamides having differing crystalline structures. (Col. 2, lines 17 – 29; Col. 5, lines 1 – 5, and Col. 16, lines 10 - 18). The films of US 750 further include polyolefin layer(s). (Col. 2, lines 8 – 11). In fact, the films of US 750 can incorporate up to 7 layers, including a polyvinylidene chloride barrier layer. (Col. 4, lines 44 – 45). The multilayered films of US 750 may be partially or completely crosslinked. (Col. 3, lines 46 – 51). US 750 indicates compression ratios of 40:1 as acceptable, noting that the compression ratio may be “even greater.” (Col. 14, lines 58 – 63). US 750 merely generically notes that various of its working examples were “shirred.” (Col. 19, lines 46 – 47 and Col. 20, lines 20 – 21).

Accordingly, Applicants respectfully submit that the claimed invention is patentable in light of US 750, considered either alone or in combination with the remaining art of record.

Applicants also respectfully reiterate that US 834 is generally directed to chorizo casings incorporating a silicon-based barrier control agent that provides improved permeability. [Para. 0017]. The silicon barrier control agent has a polyhedral geometry, and is preferably a polyhedral oligomeric silsesquioxane [Para. 0023]. US 834 expressly teaches tailoring the permeability of its casings via silicon-based barrier control agent constitution or amount. [Para. 0027, Para. 0028 and Para. 0030].

Evidencing conventional wisdom, US 834 teaches that casings formed from conventional polyamide blends suffer from “un-shirring” prior to stuffing. US 834 goes on to note that for those and “other reasons” polyamide casings “are not used today.” [Para. 0016]. US 834 expressly teaches application of a cellulosic coating to impart casing stability. [Paras. 0033 - 0036]. In fact, US 834 particularly notes that “this coating ... provides a shirred stick that is ... sufficiently rigid for transportation ... and provides sufficient resistance to premature unshirring.” [Para. 0035].

There would have been no motivation to have combined the cited references. US 635 is directed to alkaline treatments for liquid-smoke-transfer casings. JP 059 is similarly directed to smokeable films. US 750 is directed to films formed from a mixture of polyamides that may be oriented using hot water or steam. US 834 is directed to casings incorporating a particular silicon-based barrier control agent. These are altogether different issues, to say the least.

However, even if Applicants had combined US 635, JP 059, US 750 and US 834 (which they did not) the present invention would not have resulted.

US 750 indicates that compression ratios as low as 40:1 as acceptable. Applicants respectfully reiterate that the smoked casings of US 635 would not be sheared at the recited elevated compression ratios.¹ In contrast to the recited intrinsically stable casings, US 771 and US 834 both teach cellulosic coatings imparting shirred stability. Newly cited JP 059, altogether silent as to shirring, does not cure the deficiencies in the foregoing references.

Consequently, the combination urged within the outstanding Office Action would, at best, result in a casing formed from either cellulose or a combination of two polyamides that further includes a silicon-based barrier control agent and cross-linked polymer and additionally includes a cellulosic shirring-stabilizing coating and moderate compression ratio.

Thus the combination of the cited references simply does not teach or suggest the recited food casings consisting essentially of synthetic polymers comprising (i) aliphatic polyamide and copolyamide and (ii) at least one further polymer selected from the group consisting of ionomers, ethylene/(meth)acrylic acid esters, polyurethanes, copolyesters, biodegradable polyesters, and water-soluble polymer, much less that such casings would bend under the effect of its own weight by no more than 20 % and exhibit a water vapor permeability of 20 to 1000 g/m² d.

¹ If ultimately deemed necessary, a Declaration under 35 USC 132 may be prepared by Dr. Gerhard Grolig discussing appropriate compression ratios for liquid-smoke-transfer casings.

And the combination most certainly does not teach or suggest such food casings in which the water vapor permeability is essentially imparted by the synthetic polymers. Applicants respectfully reiterate that US 834 instead clearly requires a silicon-based barrier control agent, i.e. a silsesquioxane, to control permeability, rather than the claimed polymer mixture. Stated differently, even if Applicants had looked to US 834 (which they did not), a food casings incorporating a polymer mixture chosen to impart the recited water vapor permeability would not have resulted, in contrast to the urgings of the outstanding Office Action on Page 7, second full paragraph.

Nor does the combination teach or suggest the claimed intrinsically stable shirred casings. Both US 750 and US 834 expressly teach cellulosic coatings to impart shirring stability. JP 059, altogether silent as to shirring, does not cure this deficiency.

And the combination can not teach or suggest such food casings compressed in a ratio of 100:1 or more, as further recited in the claimed invention. Applicants respectfully reiterate that to modify US 635 so as to incorporate such an elevated compression ratio would render US 635 unfit for its intended purpose as a smoke-transport casing. US 750 indicates a compression ratio of 40:1 as acceptable. JP 059, altogether silent as to shirring, likewise fails to cure this deficiency.

The combination similarly can not teach or suggest that such advantageous shirred food casings would have a sigma-5 value (longitudinal/transverse, measured wet) of less than 10/10 N/mm², as recited in Claim 3 as-amended, or of less than 20/20 N/mm², as recited in newly added Claim 25.

The combination also does not teach or suggest that advantageous food casings further comprising at least one of (i) an outer coating of oil or water and (ii) an outer surface tension of 40 to 50 mN/m imparted by corona treatment would result in shirred casings extending in the longitudinal direction by no more than 10 %, as recited in Claim 22. As indicated by the Examiner, US 635, US 750 and US 834 do not teach or suggest Claim 22. Applicants

respectfully reiterate that JP 059 is altogether silent as to shirring, and thus can not cure the deficiencies in the foregoing references.

Nor does the combination teach or suggest advantageous inventive food casings formed from synthetic polymers consisting of a mixture of a single copolyamide, a polyether block amide and partially or completely saponified polyvinylacetate, as recited in Claim 23. US 635 generically teaches "plastics." US 834 is solely directed to polyamide-based casings. US 750 expressly requires first and second polyamides. JP 059 requires a specific binary polymer blend that includes cross-linked polyvinyl pyrrolidone.

The combination likewise fails to teach or suggest advantageous food casings in which the water-soluble polymer is other than polyvinyl pyrrolidone, as recited in newly added Claim 24. As noted above, the cited references do not teach or suggest the claimed food casing compositions, and JP 059 further clearly requires cross-linked polyvinyl pyrrolidone

Accordingly, the cited references fail to teach or suggest the claimed invention, considered either alone or in any combination.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 3, 4, 6 through 10, 12 through 19, and 21 through 25 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

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It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

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